U.S. Army Engineer
Research and Development Center

Environmental Toxicology Laboratory Facility

Description

The Ecotoxicology and Environment Risk Team laboratories (over 5,000 sq ft) include the culture facility, toxicology laboratory, and biochemistry and analytical laboratories which are equipped with all equipment necessary for the conduct of the proposed research. The toxicology laboratory has 5 "state of the science" environmental chambers for terrestrial and aquatic exposures with Fuji control microprocessors precisely manipulate experimental conditions such as temperature (± 0.2 ^{o}C), photoperiod and humidity (± 3% RH), and can be monitored remotely via the Web in real time. Each chamber is computer interfaced allowing for time based positive and negative ramping of temperature and/or humidity. Environmental chambers are monitored with dual computer controllers and backed up with a 100 KW natural gas generator. These chambers are used in aquatic, sediment and terrestrial ecotoxicology and bioaccumulation studies, as well as in the culturing of research organisms. In addition, the laboratory also has four flow-through aquatic chambers and six temperature regulated bath exposure chambers for aquatic studies. Capabilities include freshwater studies using filtered well water and three 200 gallon tanks for mixing and preparation of marine water.

Capabilities

Equipment in the biochemistry and analytical laboratories includes: micro, high-speed, and ultra centrifuges, refrigerators, analytical and microbalances, water baths, and an ultracold freezer. An Olympus SZH-ILLD stereomicroscope equipped with a Sony XC-57 digital camera and Optimus 6.1 image analysis software is available for microscopic examination. Behavioral responses are evaluated using high resolution digital camera and Noldus software. Analytical facilities include two Agilent 1100 series HPLCs with fluorescence, spectrophotometric, and radiometric detectors. Radionuclide facilities include a Beckman Coulter LS6500 scintillation counter and Wallac Wizard 3 gamma counter. Analytical capabilities for material analysis include a NOVA 3200 BET surface area analyzer (Quantachrome Corp) for the determination of specific surface area, a Leica TCS-NT confocal microscope for 3-dimensional imaging of tissues and particles at high resolution using fluorescence, and a Brookhaven 90Plus/BI-MAS instrument by dynamic light scattering (DLS) and ZetaPALs zeta potential analyzer for determining effective particle diameter and zeta potential. Additional capabilities for nanomaterial analysis include an ICP-MS coupled to field flow fractionation (FFF) and an Electroscan 2020 Environmental Scanning Electron microscope with a 4-quadrant solid-state back scatter electron detector (Oxford Instruments), and an energy-dispersive X-ray detector.

Points of Contact

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